STATE OF MAINE
PUBLIC UTILITIES COMMISSION

April 3, 2001

ORDER REGARDING
DEMAND FORECASTING
METHODS

NORTHERN UTILITIES, INC.
Proposed Cost of Gas Adjustment
For Summer May 2001 to October 2001

Docket No. 2001-118

NORTHERN UTILITIES, INC.
Proposed Cost of Gas Adjustment
For Winter 2000/2001 Period

Docket No. 2000-680

WELCH, Chairman; NUGENT and DIAMOND, Commissioners

I. SUMMARY

In this order, we determine that Northern Utilities, Inc.'s (Northern) forecasting methods are reasonable. We require Northern to file semi-annual reports indicating the accuracy of its forecasts, the amount of customer migration, and progress in enhancing coordination between its marketing and forecasting departments.

II. PROCEDURAL HISTORY

In Docket No. 2000-140, the Commission directed Northern to investigate its demand forecasting methods to determine if flaws were in any way responsible for significant over- and under-collections experienced by Northern in recent cost of gas periods. In response to Commission Staff's Oral Data Request 1-3 in Docket 2000-680, Northern provided the results of its preliminary review.

A technical conference was held on September 28, 2000 to discuss the results of Northern's preliminary demand forecast review. Northern stated in this conference that it needed more time to perform a detailed review.

In Docket No. 2000-680, the Commission directed Northern to file a work plan within 30 days of the Order showing what analysis it planned to undertake in review of its demand forecast methodology and a schedule indicating when the Company would complete each step. *See Order* (Oct. 31, 2000). Northern filed its work plan on November 30, 2000. The Commission also directed that the schedule allow Northern to complete its investigation in time for the filing of its Summer 2001 CGA filing.

On January 31, 2001, Northern filed the results of its analysis. The Hearing Examiner issued a Procedural Order on February 13, 2001 requesting that the Office of

Public Advocate, the only other party to the case, file comments on Northern's response. The OPA filed its comments on March 1, 2001, indicating that it finds Northern's review and current forecast methodology to be adequate. However, OPA requests that the Commission require Northern to file periodic reports as it works on developing a simplified demand forecast model for future use.

On March 21, 2001, the Commission Staff held a recorded teleconference to discuss Northern's response, the OPA's comments and any future process that may be necessary. During the conference, the parties and the Staff agreed to recommend the OPA's proposal for approval with minor changes.

III. DISCUSSION

A. Background and Issues

In our review of Northern's 2000 summer CGA, we noted that Northern has previously had large over- and under-collections as a result of variances between its forecasted and actual sales. *See Northern Utilities, Inc., Application for Change in Cost of Adjustment for the 2000 Summer Period*, Docket No. 2000-140, Order (Apr. 28, 2000). Northern stated that it believed that the major reason these variances existed was that its forecasting model did not reflect a recent period of expansion curtailment and, as a result, had improperly estimated growth. However, Northern stated that it had not thoroughly investigated that premise to determine if its belief was accurate or if the variances may instead have resulted from errors or deficiencies in its forecasting model.

We are concerned about excessive forecast inaccuracy not only because it produces large over- under-collections which mask price signals to consumers but also because of the potential impact on Northern's overall cost of gas. For example, if Northern is forecasting unrealistically high sales volumes, it could be subscribing to excess pipeline capacity and purchasing excess commodity gas, thus unnecessarily inflating its overall gas costs. Conversely, an unrealistically low gas demand forecast could result in insufficient pre-subscribed pipeline capacity or gas, requiring potentially expensive spot market purchases. In either case, the cost of gas to the ratepayers could be higher than necessary.

At the Advisory Staff's and the OPA's request, Northern agreed to review its forecast model to determine the cause of its recent forecasting errors and to include the results of that investigation in its 2000-2001 Winter CGA filing. However, Northern failed to include the explanation of forecast variances in that filing. In response to a Staff data request, Northern provided information that was explored at the September 28th technical conference.

First, it appeared that for the period Northern considered, August 1996 to May 2000, the forecast was relatively inaccurate.[1] In particular, Northern's forecast did not appear to explain any of the difference between actual and average sales. Northern argued that the errors in forecasting were the result of a sales moratorium Northern implemented from May 1997 through February 1999 due to uncertainty over future gas supply availability. The moratorium resulted in slowed growth for a time, then accelerated growth after it was lifted.[2]

However, the Staff presented an analysis, Advisors' Exhibit 2, which appeared to indicate that Northern's forecast model actually predicted sales more accurately during the moratorium period than for non-moratorium periods. This suggested that the moratorium might not have been the reason for the forecast errors. Company witness Stan Dziura, indicated that he needed more time to consider whether this indicated a problem with the accuracy of the forecast. *See* Docket No. 2000-680, Tr-A-42-44.

On January 31, 2001, Northern filed a report analyzing its demand forecasting process. The Company stated that it had demonstrated: (1) its demand forecast model was sound; (2) the demand forecasting process continues to improve; and (3) the long-term financial impact of any demand forecast variance on its customers is minimized given both the reconciling nature of the CGA and the Company's resource procurement strategy.

Northern typically uses models that rely on historical trends adjusted to reflect the impact of more recent changes in exogenous factors, to the extent predictable. Estimating the adjustment was difficult during the August 1996 to December 2000 review period, given the number of significant and unprecedented changes that took place. Specifically, Northern noted the following occurrences that could have caused the variances in its forecasts:

- Maritimes & Northeast Pipeline and Portland Natural Gas Transmission System going into service
- Unbundling – specifically, load changes resulting from customer migration to transportation service

[1] One common measure of the accuracy of a forecast is to calculate the percentage of the variance in the dependent variable being forecasted, in this case sales, which is explained by the forecast. For example, the actual sales during a period of time might differ from the mean sales over that period by 100 units, on average. If the analysis explains a variation from the mean of only 50 units during the period, we could conclude that the forecast was explaining one-half, or 50%, of the variation in the dependent variable.

[2] The moratorium was suspended once it became apparent that the Portland Natural Gas Transmission System (PNGTS) would be constructed and in service in time for the 1999-2000 winter period.

- Temporary sales moratorium
- Post-moratorium marketing programs
- Historic lows of oil prices

In its review, Northern focused on fiscal year 1999 and determined that the unexpected shifts in the historical trends were primarily due to transportation migration, meter erosion, and anticipated versus actual sales. Northern adjusted the raw forecasts produced by the models but the adjustments inadequately explained these factors. Northern is now monitoring these factors more closely for their potential impact on future demand forecasts.

In addition, Northern has taken steps to try to improve its demand forecast methods. Northern has incorporated demand forecasting into the sales and marketing function, which should allow the forecast to reflect marketing efforts more accurately. Northern will also review and analyze both meter losses and additions separately – it used a net-change method in the past. The Company is now monitoring the effects of transportation migration and developing better methods to forecast those changes. Northern is also reviewing its forecasting method to determine if a more simplified method would produce accurate results in a more timely manner.

Finally, Northern's report addressed the Commission's concerns regarding the impact of the cost of improper forecasting on its gas consumers through increased commodity or demand costs. The Company indicated that it uses different forecasting methods for short-term forecasting (needed to assess sales for a CGA period) and long-term forecasting (used to determine its resource acquisition strategy). The CGA filing is based on forecasted normal demand, including adjustments to normalize weather and to reflect other anticipated market changes. Northern's resource acquisition strategy, both over its long-term planning horizon and within a given season, is based on a combination of forecasted design demand[3] as well as day-to-day and month-to-month market changes. This policy is designed to meets its customers' full firm requirements under the most extreme situations.

B. OPA's March 1, 2001 Comments

The OPA concluded that Northern's forecasting methodology appeared sound but that its implementation requires improvements. It recommended Northern make the following filings in order to track the Company's improvement in the accuracy of its forecasts, in monitoring customer migration, and in coordinating marketing and forecast personnel:

[3] When planning its design demand forecasts, Northern structures its portfolio, including both capacity and commodity resources, to ensure it will be able to meet its customers' full firm requirements under the most extreme weather conditions.

1. An analysis of forecast accuracy based upon comparative ex post analysis of the variance resulting from different forecast methodologies involving, at a minimum, an evaluation of the performance of the current methodology relative to the new methodology selected by the Company.

2. A report on customer migration, including a list of customers actually migrating, the date of migration, and the individual load loss resulting from migration. (It is not necessary to name the individual customers that migrate.)

3. A statement on progress in the coordination between the marketing and forecasting departments and an explanation of any future changes in the organization of the two departments.

The OPA recommended that these reports be filed semiannually beginning June 1, 2001 and concluding December 31, 2002. At the March teleconference, Northern indicated that it would prefer that filing dates coincide with the filing of the CGAs. The OPA accepted this change.

IV. CONCLUSION

After reviewing the information presented by Northern, we concur that its forecasting methods appear to be generally sound. It is difficult to forecast the effect of any change in the industry upon customer usage, and consequently forecasting differences will result. The task of forecasting the effects of several significant simultaneous changes is a difficult one, and in hindsight, it is obvious that the existing methodology did not forecast these changes properly. However, the steps taken and proposed by Northern should lead to further refinements that can be made to improve forecast accuracy. Moreover, because Northern relies on a separate long-term forecast for its resource planning, it does not appear that Northern's resource plan or supply purchases will be adversely impacted by these short-term forecast inaccuracies.

Our decision today, however, should not be construed as affording prudency protection for the adherence to or application of any particular forecast or methodology, including this one, in any specific instance.

We see a benefit in the OPA's periodic reporting recommendations to monitor these adjustments and others needed to accommodate further changes in the gas industry. Therefore, we require Northern to file these reports with its CGA filings, beginning with Northern's next CGA filing, due August 15, 2001 and continue through its February 15, 2003 CGA filing.

Accordingly, we

ORDER

1. That Northern Utilities, Inc. must file a report containing the information recommended by the OPA and indicated above, semi-annually with its CGA filing; and

2. That Docket No. 2000-680, Northern Utilities, Inc., Cost of Gas Adjustment for the Winter 2000/2001 Period is hereby closed.

Dated at Augusta, Maine, this 3rd day of April, 2001.

BY ORDER OF THE COMMISSION

Dennis L. Keschl
Administrative Director

COMMISSIONERS VOTING FOR: Welch
Nugent
Diamond

NOTICE OF RIGHTS TO REVIEW OR APPEAL

5 M.R.S.A. § 9061 requires the Public Utilities Commission to give each party to an adjudicatory proceeding written notice of the party's rights to review or appeal of its decision made at the conclusion of the adjudicatory proceeding. The methods of review or appeal of PUC decisions at the conclusion of an adjudicatory proceeding are as follows:

1. Reconsideration of the Commission's Order may be requested under Section 1004 of the Commission's Rules of Practice and Procedure (65-407 C.M.R.110) within 20 days of the date of the Order by filing a petition with the Commission stating the grounds upon which reconsideration is sought.

2. Appeal of a final decision of the Commission may be taken to the Law Court by filing, within 30 days of the date of the Order, a Notice of Appeal with the Administrative Director of the Commission, pursuant to 35-A M.R.S.A. § 1320(1)-(4) and the Maine Rules of Civil Procedure, Rule 73, et seq.

3. Additional court review of constitutional issues or issues involving the justness or reasonableness of rates may be had by the filing of an appeal with the Law Court, pursuant to 35-A M.R.S.A. § 1320(5).

Note: The attachment of this Notice to a document does not indicate the Commission's view that the particular document may be subject to review or appeal. Similarly, the failure of the Commission to attach a copy of this Notice to a document does not indicate the Commission's view that the document is not subject to review or appeal.